



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,510	08/28/2003	Gerald Charles Tustin	71535	6814

40850 7590 07/19/2006  
ERIC D. MIDDLEMAS  
EASTMAN CHEMICAL COMPANY  
P. O. BOX 511  
KINGSPORT, TN 37662-5075

EXAMINER

HAILEY, PATRICIA L

ART UNIT PAPER NUMBER

1755

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/650,510

Applicant(s)

TUSTIN ET AL.

Examiner

Patricia L. Hailey

Art Unit

1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 and 16-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

Art Unit: 1755

Applicants' remarks filed on May 2, 2006, have been carefully considered.

Claims 1-40 remain pending in this application.

### ***Election/Restrictions***

1. Claims 9-12 and 16-40 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 3, 2005.

### ***Withdrawn Rejections***

The objection to the Specification for the misspelled word "macopore" has been withdrawn in view of Applicants' correction of this word.

The 112(2) rejection of claims 13-15 stated in the previous Office Action has been withdrawn in view of Applicants' persuasive arguments traversing this rejection.

### ***Maintained Rejections***

2. The following rejections of record are maintained; the text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

3. ***Claims 1-5 and 13-15 stand rejected under 35 U.S.C. 103(a) as being obvious over Maroldo et al. (U. S. Patent No. 4,839,331).***

Art Unit: 1755

Maroldo et al. teach adsorbent particles made by partially pyrolyzing, in an inert atmosphere, at temperatures of from about 300°C to about 1200°C, polysulfonated, macroporous, vinylaromatic copolymers (considered to read upon **claim 1**). See col. 3, lines 3-12 of Maroldo et al.

In the Examples of Maroldo et al., exemplary polysulfonated particles (defined as beads; see col. 9, lines 7 and 8 of Maroldo et al.; considered to read upon **claim 2**) are depicted; these particles exhibit BET surface areas within the respectively recited ranges in Applicants' **claims 4, 5, and 15**. See Tables 1, 2, 5 and 6 of Maroldo et al., as well as the corresponding Examples.

Additionally, Tables 1 and 6 of Maroldo et al. also show pore volume ranges for the polysulfonated particles. At col. 4, lines 40-48, Maroldo et al. disclose pore diameter ranges categorized as "macropore", "micropore", and "mesopore". Based on Applicants' definition of "pore volume ratio", i.e., the sum of the macropore volume and mesopore volume divided by the micropore volume, the pore volume ratio of, for example, the polysulfonated copolymer of Example 4A, exhibits a pore volume ratio of  $(0.44-0)/(0.219+0.0152) = 1.878$ , or, optionally,  $(0.44 + .0152)/.219 = 2.078$  (based on the definitions of "macropore", "mesopore", and "micropore", as disclosed by Maroldo et al.; the first equation being based on the assumption that the amount of mesopore volume is zero). Thus, the polysulfonated particles of Maroldo et al. are considered to exhibit pore volume ratios comparable to those recited in **claims 5 and 15**.

The particles are polysulfonated by contacting the macroporous resin with fuming sulfuric acid (also known as oleum) for a period of from about 5 hours to about 20 hours

Art Unit: 1755

or more at temperatures ranging from about 100°C to about 150°C. See col. 4, line 57 to col. 5, line 5 of Maroldo et al. (considered to read upon the limitations of **claim 13** regarding the "sulfonation conditions of time, temperature and pressure...", i.e., **step (i)**), which also discloses that the polysulfonated resin is preferably hydrated, then washed to remove acid and dried prior to calcining (considered to read upon **step (ii) in claim 13**).

The pyrolysis may be performed at temperatures from about 300°C to about 1200°C; further, the particles may be agitated and/or heated with steam or hot gases. See col. 5, lines 6-16 of Maroldo et al. (considered to read upon **step (iii) in claim 13**).

Maroldo et al. also teach that the pyrolyzed polysulfonated particles may be further activated by exposure to gases such as oxygen, steam, ammonia, carbon dioxide at temperatures ranging from about 300°C to about 1200°C or more. See col. 5, lines 36-42 of Maroldo et al. (considered to read upon **claim 14**).

Maroldo et al. is silent with respect to the particle size of the polysulfonated particles. However, because Maroldo et al. disclose carbonized polysulfonated polymer particles exhibiting surface areas and pore volume ratios comparable to that respectively claimed, it would have been obvious to one skilled in the art at the time the invention was made to reasonably expect that the particles of Maroldo et al. would also exhibit particle sizes comparable to that respectively claimed, absent the showing of convincing evidence to the contrary.

It is well settled that when a claimed composition appears to be substantially the same as a composition disclosed in the prior art, the burden is properly upon the

Art Unit: 1755

applicant to prove by way of tangible evidence that the prior art composition does not necessarily possess characteristics attributed to the CLAIMED composition. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Circ. 1990); In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980); In re Swinehart, 439 F.2d 2109, 169 USPQ 226 (CCPA 1971).

Additionally, although Maroldo et al. disclose the employment of “20% oleum” (Example 3) and “4% oleum” (Example 21), the reference does not specifically disclose “30% oleum”, as recited in claim 13. However, Maroldo et al. at col. 4, lines 57-59 disclose that it is known in the art to employ fuming sulfuric acid (“oleum”) to conduct polysulfonation of macroporous resins. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimal concentration of fuming sulfuric acid/oleum in an endeavor to obtain a macroporous resin having the desired extent of polysulfonation.

**4. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoeller et al. (U. S. Patent No. 6,452,043) in view of Maroldo et al. (U. S. Patent No. 4,839,331).**

Zoeller et al. disclose catalysts comprising a catalytically effective amount of an active metal selected from iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum (considered to read upon the limitations “Groups 4-12 of the Periodic Table” and “Groups 8-12 of the Periodic Table” in **claims 6 and 8**) and, optionally, a secondary metallic promoter, selected from alkali metals, alkaline earth

Art Unit: 1755

metals, lanthanides, in which the active metal is associated with a support matrix comprising carbonized polysulfonated divinylbenzene-styrene copolymers. See col. 5, line 50 to col. 6, line 4 of Zoeller et al., which also makes reference to Maroldo et al. as suitable carbonized polysulfonated divinylbenzene-styrene copolymers (col. 6, lines 2-4).

Additionally, Zoeller et al. disclose that the active metal and secondary metal are associated with the support material as a result of soluble impregnation of the metals which may result in either a salt of the metals, an oxide of the metals, or metal in a free state deposited on the support. See col. 6, line 66 to col. 7, line 3 of Zoeller et al. This disclosure is considered to read upon the alkali metal and alkaline earth metal oxides recited in **claim 7**.

Although Zoeller et al. disclose a support matrix that reads upon the limitation "carbonized polysulfonated vinylaromatic polymer" recited in claim 6, the reference is silent with respect to the properties also recited in this claim.

Maroldo et al. is relied upon for its teachings with respect to claims 1-5 and 13-15, as stated above, with respect to the claimed properties of the carbonized polymer particles, as recited in claim 6.

Since the prior art appears to disclose the invention as claimed on the basis of inherent property characteristics which either anticipate or render the claimed product obvious (as addressed in the above 103(a) rejection, see paragraph 3), therefore, the burden of proof that it does or does not shifts to the applicant as in *In re Best* 195 USPQ 430, 433 (CCPA 1877).

Art Unit: 1755

**5. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoeller et al. (U. S. Patent No. 6,235,673) in view of Maroldo et al. (U. S. Patent No. 4,839,331).**

Zoeller et al. disclose catalysts comprising a catalytically effective amount of an active metal selected from iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum (considered to read upon the limitations "Groups 4-12 of the Periodic Table" and "Groups 8-12 of the Periodic Table" in **claims 6 and 8**) and, optionally, a secondary metallic promoter, selected from alkali metals, alkaline earth metals, lanthanides, in which the active metal is associated with a support matrix comprising carbonized polysulfonated divinylbenzene-styrene copolymers. See col. 4, line 48 to col. 5, line 30 of Zoeller et al., which also makes reference to Maroldo et al. as suitable carbonized polysulfonated divinylbenzene-styrene copolymers (col. 5, line 28).

Additionally, Zoeller et al. disclose that the active metal and secondary metal are associated with the support material as a result of soluble impregnation of the metals which may result in either a salt of the metals, an oxide of the metals, or metal in a free state deposited on the support. See col. 6, lines 24-28 of Zoeller et al. This disclosure is considered to read upon the alkali metal and alkaline earth metal oxides recited in **claim 7**.

Although Zoeller et al. disclose a support matrix that reads upon the limitation "carbonized polysulfonated vinylaromatic polymer" recited in claim 6, the reference is silent with respect to the properties also recited in this claim.



Art Unit: 1755

Maroldo et al. is relied upon for its teachings with respect to claims 1-5 and 13-15, as stated above, with respect to the claimed properties of the carbonized polymer particles, as recited in claim 6.

Since the prior art appears to disclose the invention as claimed on the basis of inherent property characteristics which either anticipate or render the claimed product obvious (as addressed in the above 103(a) rejection; see paragraph 3), therefore, the burden of proof that it does or does not shifts to the applicant as in *In re Best* 195 USPQ 430, 433 (CCPA 1877).

### ***Response to Arguments***

In response to Applicants' arguments that the prior art does not teach or suggest Applicants' claimed particle size range of 1 to 200  $\mu\text{m}$ , the Examiner respectfully points out that Maroldo et al. '331 at col. 4, lines 49-56 state:

"Although resin beads of the size produced by conventional suspension polymerization process are a useful size for the further reactions and end uses, the process may be conducted on **larger or smaller** beads, and even on ground macroporous resins produced in non-bead form. For adsorbent and separative use, the resins may **be further ground or selectively sieved to produce the desired particle size.**" (Emphasis added by the Examiner.)

From this disclosure, one of ordinary skill in the art would find sufficient reason to employ these techniques to employ vinylaromatic polymer particles of a size sufficient to provide carbonized particles exhibiting Applicants' claimed average particle diameter.

Although Example 1 of Maroldo '331 discloses the production of particles having a diameter of 0.85-2.5 mm (850-2500  $\mu\text{m}$ ), this example is merely a preferred embodiment of Patentees' invention and should not be construed as its sole invention.

The same reasoning applies to that of the remaining references of record. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments. Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989).

For these reasons, the rejections of record are maintained, and Applicants' arguments are not persuasive.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1755

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

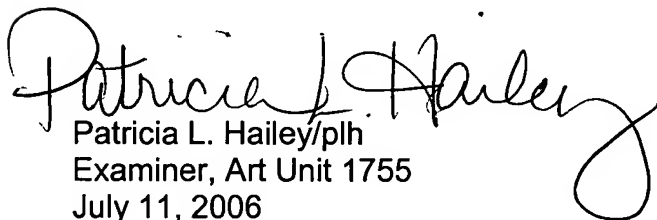
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Art Unit: 1755

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
July 11, 2006

  
J. A. LORENZO  
SUPERVISORY PATENT EXAMINER